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AN ECONOMIC ANALYSIS OF NEW GAS DEREGULATION

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AN ECONOMIC ANALYSIS OF "NEW" GAS DEREGULATION

SUMMARY

The Senate-passed bill offered by Senators Pearson and Bentsen (S. 2310) and a similar bill proposed by Congressman Krueger (H.R. 11265) to deregulate the wellhead price of new natural gas are intended to lead to gradual increases in gas prices to consumers. Those bills, and economic studies that have supported them, agree that an orderly price increase would help bring demand and supply into balance, and simultaneously reverse the supply imbalance between the unregulated intrastate market and the regulated interstate market. Studies on the effect of deregulation have assumed that new (deregulated) gas would sell for a wellhead price no higher than the equivalent price for oil: about $2.11 per mcf. During two weeks of hearings before the Subcommittee on Energy and Power, many complex features of the natural gas market were explored, and one critical finding is that the short-term response to deregulation may see new gas wellhead prices rise far beyond the oil-equivalent price. Producers would also wield strong power to force pipelines to renegotiate existing contracts at higher prices. These factors could cause a sudden increase in customer charges and producer revenues of more than $13 billion. A large and sudden price response to deregulation would have dramatic economic implications, far larger than those anticipated under sudden decontrol of oil prices, and approaching the impact of the oil price increases of the post Arab oil embargo period.

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As with most questions of large macroeconomic impact, the economic costs of new gas deregulation will be less acute if price increases are gradual rather than abrupt. While it is not certain that either S. 2310 or H.R. 11265 will cause a sudden jump in average wellhead prices, they contain no guarantees of an orderly transition to full deregulation. The

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incremental pricing provisions in S. 2310, which would load all new gas price increases onto industry and utility purchasers, represent one possible approach toward lessening the severity of short-term price response to deregulation. Additional measures, such as an interim ceiling price for new gas contracts, could act as a further shield against excessively high prices over the short term. Such a ceiling price should be high enough to forestall only inordinately intense bidding competition which may be sparked by new gas deregulation.

This Committee Print reviews two estimates of short and long term costs of new gas deregulation recent published by (1) the General Accounting Office (GAO) in Implications of Deregulating the Price of Natural Gas and (2) the Federal Energy Administration (FEA) in "Natural Gas Deregulation Analysis, Technical Report" presented in testimony before the House Subcommittee on Energy and Power on January 23, 1976. With the assistance of consultants at Chase Econometrics Associates, the dollar cost of deregulation from these two studies were simulated on a long term computer model of the U.S. economy. The model shows how such economic variables as real GNP, consumer prices, and unemployment would be affected by deregulation.

Arguments will also be offered that these forecasted economic impacts of deregulation, while very large in their own right, may understate actual economic losses resulting from new gas deregulation. Underestimates are due to the possibility that average wellhead prices for gas could rise much more quickly than anticipated in either the GAO or FEA reports. The print concludes with potential legislative measures to avert a sudden increase in wellhead prices, beyond a price equivalence with oil.

Dollar Costs of Deregulation

In a deregulated market for natural gas, consumers (and the pipelines through which they obtain gas from suppliers) will wish to purchase gas so long as gas is cheaper than other energy substitutes. The energy content of a barrel of crude oil or a barrel of #2 distillate (home heating oil) is 5.6 times the energy content of 1000 cubic feet (MCF) of natural gas. A BTU equivalent price for oil and natural gas can therefore be computed by dividing the price of a barrel of oil by 5.6. FEA focuses its analysis on the relationship between #2 fuel oil and natural gas.

> "A number 2 fuel oil price of $15.50/bbl (the average price to industrial and residential customers in 1974) is comparable to a retail natural gas price of $2.66/MCF. To get the wellhead price, transportation and distribution cost are subtracted. In 1974 the average transportation cost plus distribution mark-up was 55¢/MCF. This yields a deregulated wellhead price of ($2.66-.55¢)=$2.11/MCF." (FEA,p.18)

The GAO, in a less carefully constructed comparison of oil and natural gas prices, concludes that

"Under deregulation the city-gate price of both interstate and intrastate natural gas is expected to rise to an average of about $2.10 per MCF. This is essentially the BTU-equivalent of $12.00 per barrel imported or uncontrolled domestic crude at the refinery. The $2.10 per MCF city-gate price is composed of $.35 per MCF which is the average interstate pipeline transportation charge, and $1.75 per MCF, the average deregulated wellhead price."

The GAO report compares the cost of unrefined oil with the city-gate price of natural gas. A better procedure would be to compare refined oil prices paid by utilities with the city-gate price for natural gas, because utilities buy gas at close to the city-gate price. This possible error would place a downward bias on the equivalent price for gas as used in the GAO report and may result in slight underestimates of the cost of deregulation.

Assuming that volumes of unregulated gas rise within one year to a price equivalence with oil, the FEA calculates the first-year dollar cost of deregulation under the Pearson-Bentsen bill to be about $5.5 billion. This cost is derived by assuming that 5TCF (about one-half) of intrastate gas will rise from the present intrastate new contract price of $1.25/MCF to $2.11 (5 x $.86 = $4.3 billion). Prices for non-jurisdictional sales and new interstate sales (totaling 1.6 TCF) increase to bring the total first-year increase in revenues to producers (and expenditures by natural gas consumers)to $5.5 billion.

The GAO report does not calculate first-year costs, but does provide net dollar-cost estimates of new gas dereguation for the years 1978, 1980, and 1985. GAO assumes that under continued regulation natural gas prices will rise by 5¢ per year in the interstate market and 15¢ per year (to the $1.75 MCF equivalence) in the intrastate market.*

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* Current interstate prices average $.35 per MCF while intrastate prices average $.50 per MCF.

Net costs of deregulation are then computed by subtracting city-gate revenues under continued regulation from city-gate revenues under deregulation. As the following chart and text from the GAO report indicate, account has also been taken of the fact that lower production under continued regulation will force some customers to alternate fuels.

Table 1
City-Gate Costs of Energy Regulation and
Deregulation to Consumers of Natural Gas in 1975
(Billions of Dollars)

Year	Regulation	Deregulation	Net Cost
1975	17.8		
1978	26.7	35.0	$8.3 Billion
1980	31.9	44.9	$13.0 Billion
1985	40.6	44.9	$ 4.3 Billion

"The table indicates that in 1975 it is projected that 21.4 TCF of natural gas will be delivered to consumers at an average city-gate price of $.83 per MCF for a total cost of $17.8 billion. In 1980 it is projected that, under continued regulation, 18.1 TCF will be delivered to consumers at an average city-gate price of $1.37 per MCF for a total cost of $24.9 billion. Since 3.3 TCF of 1975 natural gas consumption must be replaced by other energy sources at an equivalent city-gate price of $2.10 per MCF, there is an added $7 billion cost to the consumers, giving a total cost to the consumers of $31.9 billion. This is an increase of $14.1 billion or 79 percent over their costs for the same amount of energy in 1975.

"Under deregulation natural gas consumption if 18.8 TCF in 1980 at an average city-gate price of $2.10 per MCF for a cost of $39.5 billion; the cost for the alternate energy sources to replace the 2.6 TCF shortfall relative to 1975 ($2.10 per MCF equivalent) is $5.4 billion. This give a total cost of $44.9 billion. Thus under deregulation city-gate costs for 1975 natural gas consumers would increase $27.1 billion in 1980 over 1975, or $13 billion over what the 1980 costs would have been under continued regulation. Under deregulation city-gate costs in 1980 will be 152 percent greater than 1975 costs and 41 percent greater than 1980 costs with continued regulation. These same calculations for 1985 indicate that deregulated costs would continue at $44.9 billion (152 percent greater than 1975) and regulated costs would climb to $40.6 billion (128 percent greater than 1975); in 1985 deregulation costs would be 11 percent greater than regulation." (GAO, pp 44-45

The $5.5 billion first-year cost of deregulation calculated by FEA appears to be consistent with the GAO longer-term cost stream.

The computed cost of deregulation over time is to some degree dependent on assumptions about supplies of gas under continued regulation and deregulation. FEA states that

> "To the extent that increased natural gas production replaces higher priced imported oil, the above (first year dollar cost) estimate is reduced."(FEA p.19)

FEA, which utilizes a sophisticated model of regional natural gas supply and demand, argues that domestic production of gas in 1985 would be 4.8 TCF greater with the Pearson-Bentsen bill than with continued regulation. Under the Krueger bill, the difference in projected supplies is 4.1 TCF. The GAO report, which is not specific with respect to any new gas deregulation bill, assumes a 1.5 TCF supply differential in 1985.

FEA supply response estimates are based upon extrapolation of historical price-supply relationships to higher prices and into the future. GAO's estimates, on the other hand, are based largely on geological rather than economic considerations. According to GAO

"Many studies have claimed that deregulation would reverse the trend of production decline. Such conclusions are based on the judgements on the price response to deregulation, the drilling rate response to higher wellhead prices, the amount of undiscovered resources, and the finding rates. These judgments are subject to great dispute. However, regardless of the differing judgments on these factors there is a reasonable consensus in both Government and industry regarding reserve additions required to achieve a particular level of production."

* * * *

"To maintain the current production rate of about 21 TCF requires an average annual reserve addition of about 23 TCF for the 11-year period 1975 to 1985, which is larger than what was observed over any prior

11-year period. On the basis of required reserve additions it would seem that maintaining existing levels of natural gas production would be very difficult, if not impossible."

"To achieve a reserve addition rate of 20 TCF per year (slightly larger than the average rate from 1955 to 1967) would necessitate the discovery of almost 15 TCF per year of new reservoirs for about 4 to 5 years, after which revisions and extensions to these new large finds could sustain the 20 TCF rate with a lower amount of new reservoir finds. Since new finds have average 4 TCF since 1969, such a possibility would imply the discovery of at least four or five large reservoirs or fields over the period with reserves on the order of 10 TCF apiece. The Gomez, West Texas, field is the only field 10 TCF or larger discovered over the same period. This would indicate there is very little likelihood of returning to a sustained 20 TCF reserve addition per year over the period 1975 to 1985.

"Undiscovered recoverable resources form the base for new finds of natural gas. Within the past year the U. S. Geological Survey has substantially reduced its estimates of this category for the lower 48. Formerly its estimates ranged from 715 to 1,415 TCF; today they range from 298 to 528 TCF. This reduction of undiscovered recoverable resources reduces the prospects for finding large amounts of additional new reserves in the lower 48.

"Industry believes that the best possibilities for large finds in the lower 48 is the OCS. Areas currently under consideration are mostly covered by up to 200 meters of water. While this depth poses no serious technological difficulties for the extraction of natural gas, the recent failure to find exploitable reserves in the eastern Gulf of Mexico and off Newfoundland, coupled with the recent significant downward revisions of undiscovered resources on the OCS, have dampend the expectations of finding large amounts of gas on the OCS." (GAO, pp. 16-20)

Macroeconomic Impacts of Deregulation

The above short and long-term dollar costs of deregulation form the basis for simulating the effect of new gas deregulations on the overall economy. Chase Econometrics Associates was requested by the Subcommittee staff to run their long range (10 year) computer model of the U.S. economy with higher natural gas prices. The first year cost, derived by FEA and longer-term GAO calculations were fed into the model. Resulting impacts*, as forecasted by the model, are as follows:

Table 2

	Real GNP	Consumer Prices	Unemployment Rate
1976	down 2.8	up .8%	up .1
1977	down 8.4	up 1.1%	up .4
1978	down 8.9	up 1.2%	up .6
1979	down 7.7	up 1.4%	up .7
1980	down 10.7	up 1.5%	up .8
1981	down 12.7	up 1.6%	up 1.0
1982	down 13.9	up 1.7%	up 1.0
1983	down 14.6	up 1.8%	up 1.1
1984	down 15.0	up 1.8%	up 1.1

Projected dollar and macroeconomic costs of new gas deregulation would be somewhat lower under the Pearson-Bentsen proposal than under the Krueger bill. Greater costs attributable to the Krueger bill arise from:

(1) a broader definition of new gas, which would include gas remaining after an esisting contract expires. The Pearson-Bentsen bill keeps all old gas under price regulation.

The Krueger bill would deregulate any gas flowing from a well drilled after January 1, 1976. Pearson-Bentsen would not permit gas from reserves already discovered and dedicated to be sold at deregulated prices.

(2) Equal pass-through of increased costs to all customers. The Pearson-Bentsen bill requires distributing companies to provide lower priced old gas to residential and small users on a priority basis, and thereby focuses higher costs of new gas onto lower priority industrial users. Congressman Krueger's bill would distribute higher cost gas evenly among all users. The potential result of this difference in the two bills is that pipelines under the Pearson-Bentsen plan would be more anxious to keep prices as low as possible on new gas, for fear that if too high a price is paid, industrial

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* All changes are relative to continuation of present regulations, not relative to current economic conditions.

customers would switch from gas to other fuels.

It is not possible to quantify exactly how much higher or faster energy prices would rise under Congressman Krueger's proposed deregulation plan. Differences between Congressman Krueger's bill and the Senate-passed Pearson-Bentson bill are considered by the FEA to lead to virtually the same wellhead price, but .7 TCF greater production rate in 1985 under the Senate bill. This higher production rate would lead to a net reduction of oil imports relative to the Krueger plan and a corresponding lower final cost to consumers.

The present average inter-and intrastate wellhead price for gas is about 44¢ per MCF. Under deregulation, this price will inevitably rise by at least a factor of four. Costs to natural gas consumers will double. During the two years following the oil embargo, wellhead oil prices also rose by a factor of four; the price at the gas pump doubled. According to the Brookings Institution, "the guadrupling of oil prices was a major cause of the worst cost-push inflationary and recessionary period since the depression.

The impact of a four-fold increase in natural gas wellhead prices under deregulation may be nearly as painful as we saw for oil. Whereas oil represents 46% of U. S. energy consumption, natural gas is 31%. But, because industry (other than transportation) is proportionately more dependent upon natural gas than oil, gas price increases may have a larger direct effect on lay-offs, corporate investment plans, and economic growth.

New gas deregulation will shift massive amounts of capital and economic power from other sectors of the economy into the natural gas producing sector. Present revenues to producers, at the current domestic production rate of 19.1. Tcf, is ($.44/MCF x 19.1 Tcf, or) $8.4 Billion. When all gas has reached FEA's $2.11 BTU equivalent price with oil, and assuming GAO's conservative 1985 domestic production rate of 17.3 TCF under deregulation, total revenues to natural gas producers would be $36.5 Billion. This represents an eventual income transfer of $28 billion per year from consumers to gas producers. Contrast this with a one-year $18 billion tax cut or last year's debate over sudden decontrol, which involved a potential $13 billion increase in producer revenues

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* Fried, Edward R. and Schultze, Charles L, Higher Oil Prices and the World Economy, the Brookings Institution, Washington, D.C. 1975, p. vii.

for old oil. Deregulation of natural gas has potentially twice the economic cost of sudden oil decontrol, and would effectively neutralize the present tax cut, if that cut were continued indefinitely.

The Brookings Institution, in a recent report on Higher Oil Prices and the World Economy, raises further questions of economic policy in response to a large cost-push price increase for natural gas.

"In the short run, 'cost push' factors can influence the rate of inflation and unemployment and thereby set in motion Government policies that may have lasting effects. When such external shocks as the rise in international oil prices or other cost push factors increase the rate of inflation, Government authorities are faced with a painful dilemma. If they do not accommodate cost push factors by letting aggregate nominal demand rise sufficiently, then real output will fall and unemployment will increase to the extent that other prices resist downward pressure. On the other hand, if these shocks are fully accommodated, forces may be set in motion which perpetuate and even increase the inflation rate. Should the rate of inflation accelerate, heavier costs in unemployment, lower output and forgone opportunities would eventually have to be incurred to bring it under control. For this reason it is important to examine the probable cost push pressures on prices over the near term." (page 31)

Relative to present expenditures for energy, an increase in total gas bills of $28 billion will cost each American an average of $127 per year. The average household would pay, either directly for heat or indirectly for higher cost goods and services, an extra $509 per year when gas prices reach an equivalence with oil. Inflation and unemployment are worsened as consumers will have less to spend on everything except natural gas. And futher problems could plague our already troubled capital markets.

Problems in a Transition Toward Full Deregulation

While the costs of deregulation, both in dollar and overall economic terms, are large, two weeks of hearings from January 20 to February 2 before the Subcommittee on Energy and Power raised serious questions about whether the transition period toward full deregulation (when all old contracts have expired) will be protracted and orderly, or sudden and disruptive.

The FEA, GAO, and other recent studies on the impacts of new gas deregulation assume that average wellhead prices will rise slowly because: (1) new gas will sell at a price equivalence with oil and (2) new gas initially represents only a small proportion of flowing gas under long-term contract. The former assumption may have questionable basis in fact. These studies fail to recognize the possibility that contracts for new gas will initially be driven far above oil-equivalent prices. Pipelines, not final customers, buy from producers. Pipelines will bid against one another for new gas until prices rise enough to jeopardize demand from final customers. Pipeline companies will want to keep the average price of gas to customers below the price of oil substitutes in order to avoid reductions in final customer demand, But the price of new gas can, and in all likelihood will, go above the oil-equivalent price so long as old gas prices are below that equivalence. The higher that new gas prices are bid in the short run, the more quickly the average price of all gas approaches the long run oil-equivalent price.

Example: A hypothetical pipeline now delivers 1 TCF of gas to its customers at the average interstate price of $.35/MCF. In 1976, 10% of its contracts will expire, so .1 TCF of new gas contracts are sought. If the pipeline bid for, and obtained this amount of gas at a price of $5.00/MCF, the average price of gas in the pipeline would be:

90% at .35/MCF and 10% at $5.00.MCF = $.84/MCF

This price is still well below the oil-equivalent price of $2.11 at which significant losses of customers would begin to jeopardize total pipeline deliveries (and revenues). In fact, the higher the price paid by a pipeline for its gas (all other things being equal) the higher are its permitted revenues. In the above example, pipelines paying $5.00 per MCF for new gas would drive the average price of all gas to a BTU equivalence with oil in less than four years. Again, such a sudden response to new gas deregulation is not inevitable -- merely possible.

Little concern has been expressed over the very real possibility that the average wellhead price for gas could reach the $2.00/MCF level within four years or less. The structure of the natural gas industry would appear to facilitate a rapid price rise. Producers, certainly, will not discourage a bidding war among pipelines leading to higher prices. Pipelines are already being urged, particularly by their industrial customers, to pay any price required to insure future gas supplies. Distributors of gas have already demonstrated a willingness to pay $3.50 or more per MCF -- the cost of synthetic gas now being produced. Last fall, New England Gas and Electric paid $5.60 per MCF to Algonquin for synthetic gas.

Producers anxious to get out of long-term contracts at low regulated prices will find many pipelines willing to renegotiate as an incentive to obtain needed new gas. Renegotiations of old contracts will also accelerate the rise in average gas prices.

Some experts argue that there is sufficient excess supply in the intrastate market to safeguard against any serious short-term prices above the $2.11 level. It is possible that as interstate prices are bid to this level, some intrastate customers will be willing to switch away from gas. But intrastate prices have already pushed through the $2.00 point in the past, and there is no proof that intrastate buyers would be unwilling to pay even higher prices in the future, given the premium nature of gas, its unique contribution to a variety of feedstock and processing applications, and the recent investments many companies have made in order to locate near a steady supply.

Legislative Options

Absent revisions or appropriate court interpretations, both the Pearson-Bentsen and Krueger proposals would not foreclose new gas prices being bid up to inordinately high levels in the short term. Should this rapid escalation ensue, the consequences for both natural gas customers and the overall economy could be devastating.

Incremental pricing provisions in the Pearson-Bentsen bill, which require large industrial users to bear increases in new gas prices, provide a mechanism to restrain pipeline bidding. The threat of losing industrial customers will appear to pipelines at an earlier point in the deregulation process if the industrial submarket bears price increases first. In effect, incremental pricing provides a more economically efficient mechanism for coupling marginal cost (to the consumer) to marginal revenues to the producer. Simply stated, the short-term problem associated with excessive new gas prices is the result of marginal revenues to producers being "blended" into the average cost to customers. The more accurately customers equate their marginal costs with marginal revenues to producers, the more efficient and orderly will be their conversion to substitute fuels. Even under the most effective incremental (or marginal) pricing scheme, a customer's short-term ability to convert to other fuels is limited. Hence the need for measures to insure that marginal revenues to producers rise slowly, perhaps over a 5 year period

In addition to incremental provisions, other safeguards deserve careful consideration. A ceiling on new gas prices is one option. But a ceiling on new gas prices may be an insufficient measure to prevent rapid rises in average prices, because more attention might simply be placed on renegotiation of old supply contracts to higher prices. The result might be analogous to rent control, in which rents are low, but the supply shortage puts the owner in such a position that he can require the renter to pay, "under the table", a "key charge" of sizable magnitude before he signs his lease. If the FPC is given clear responsibility to prohibit suppliers from forcing pipelines to renegotiate old contracts, a ceiling on new gas prices might prove effective.

If a ceiling on the average, as opposed to the new price of gas, were imposed over the transition period, the results would be similar to the above case, but would leave the new gas price/old gas renegotiation decisions to each buyer and seller.

Ceilings on either new or average gas prices should be set to act as a shield, rather than a sword, against excessively high prices over the short term. A ceiling price, or price schedule, should be high enough to forestall only inordinately intense bidding or renegotiation pressures which may be sparked by new gas deregulation.

Conclusion

Major revision of the present natural gas regulatory system is now necessary. But the potential for sudden increases in natural gas prices under new gas deregulation proposals suggests the need for specific revisions to prohibit excessive new contract prices. Such provisions would insure a longer,

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more orderly transition toward deregulation. Economic impacts would be lessened as industrial and residential customers would have more time to plan their energy use patterns. A more gradual transfer of revenues to producers would probably have little negative effect on gas supplies, but would lessen considerably the economic dislocation associated with any sudden shift of income as may result from the Krueger, and to a lesser extent, the Pearson-Bentsen deregulation proposals.